

# Green Action Team

## May 30, 2007

### Summary of Major Initiatives

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# GREEN CALIFORNIA

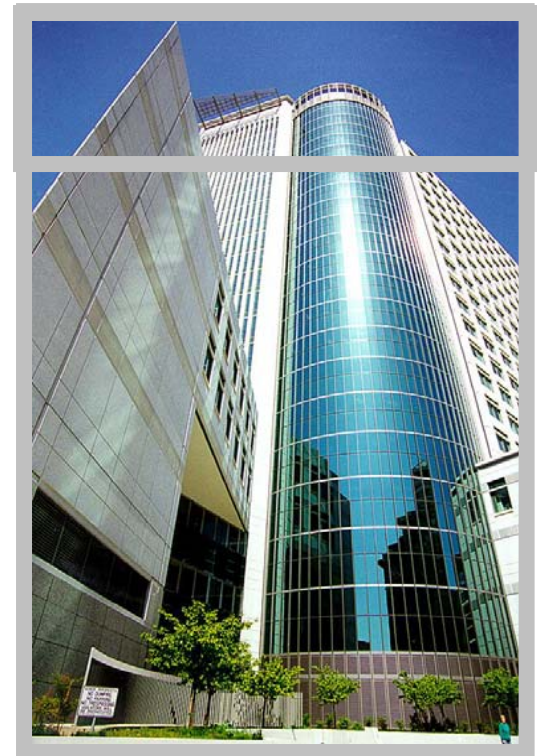
Sustainable • Energy Efficient • Green Buildings • Green Buying

# Retro-commissioning



# Retro-commissioning

- Retro-commissioning is an event in the life of a building that applies a systematic investigative process for improving or optimizing a building's overall performance and the way it is maintained and operated.



# Retro-commissioning

## Current Activities

### 2005/2006 Projects

- 3 Projects (938,245 S.F.) completed
- 25 Projects (5,992,832 S.F.) underway with investigation, final report and some measures implemented by August 2007.

### 2006/2007 Projects

- 21 Projects (4,224,029 S.F.)
- Request for Qualifications (RFQ) process underway for consultant selection.
- On-site work scheduled to begin September 2007.

# Projected Results to Date

## 2005/2006 Projects

Facility	Number of Deficiencies Identified (O&M and EEM)	Estimated % Power Savings (KWh)	Estimated % Gas Savings (Therms)	Estimated % Energy Savings (Electric and Gas)	Total Annual Savings	Total Implementation Cost	Payback Period (Years)
Fairview State Hospital	182	37.0%	0.003%	9.00%	\$460,000	\$754,215	1.6
Mission Valley	34	11.60%	18.90%	12.00%	\$27,787	\$47,316	1.7
Cal Tower	35	10.40%	11.50%	10.90%	\$35,647	\$170,502	4.7
Chula Vista Veterans Home	104	13.10%	-4.10%	8.20%	\$42,672	\$153,917	3.6
Teale Data Center	103	6.03%	48.79%	7.92%	\$47,731	\$50,000	1.0
California Lottery Commission	60	9.32%	48.08%	19.96%	\$46,922	\$100,000	2.1
Board of Equalization	272	4.95%	15.00%	6.11%	\$48,768	\$50,000	1.0
Junipero Serra Building	40	8.00%	12.00%	9.00%	\$80,000	\$75,000	1.0
Haagen Smit Building	45	5.00%	8.00%	6.00%	\$20,000	\$50,000	2.5
San Bernardino Government Center	50	15.00%	18.00%	15.00%	\$100,000	\$150,000	1.5
Corcoran Hospital	72	7.00%	10.00%	8.00%	\$50,000	\$100,000	2.0
<b>AVERAGE</b>	<b>90.6</b>	<b>11.6%</b>	<b>16.9%</b>	<b>10.2%</b>	<b>\$87,230</b>	<b>\$154,632</b>	<b>2.1</b>

•Projections made prior to Investigative Phase being completed.

# Sample Deficiencies Resulting in Poor Building Performance



**Unit with Dirty Condenser Fins**



**Inoperative Exhaust Fan/Broken Duct**



**Missing Filters**



**Dirty Cooling Coils**

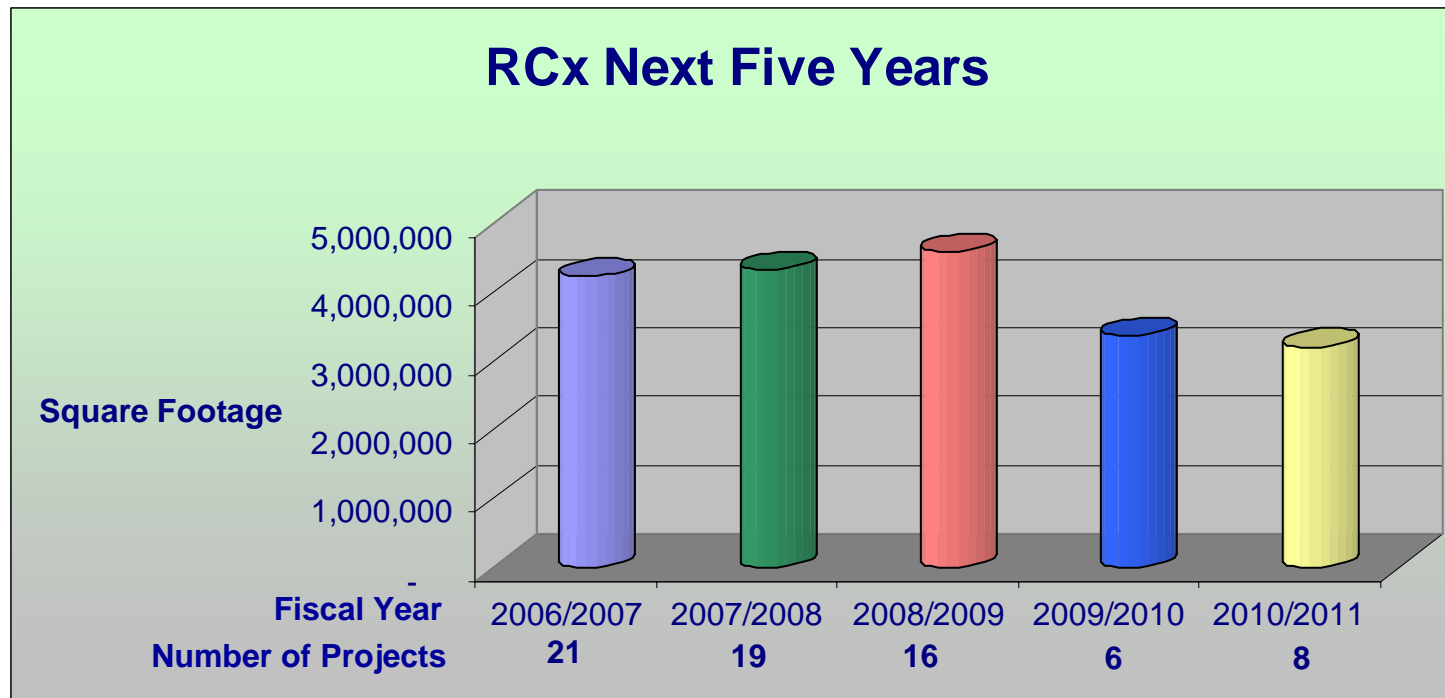


**Dirty Supply Air Plenum**

## Typical Operational and Maintenance/Energy Efficiency Improvements

- Optimize Equipment Scheduling
- Optimize Energy Management System
- Correct Improper Damper Operation
- VAV Box Calibration
- Optimize Outside Air Demand Control
- Eliminate Simultaneous Heating and Cooling
- Improve Sensor Calibration
- Clean Dirty Coils and Filters

# Future Retro-commissioning Projects



# 2006/2007 Project Funding Status

- **Funding received from:**
  - ✓ **California Department of Corrections and Rehabilitation**
  - ✓ **Department of Developmental Services**
  - ✓ **Department of General Services**
  - ✓ **Department of Mental Health**
  - **California Science Center**
  - **Department of Transportation**
  - **Department of Veteran's Affairs**
  - **Military Department**
- \* **Funding needed by 7/15/07**

# Retrofits/Energy Efficiency (ESCO) Program



# Current Activities

- Authority to qualify a pool of ESCOs from Public Utility Code 366
- State entered into a Partnership Agreement with the Investor Owned utilities earmarking \$17 million in incentive funds for State Energy Efficiency projects.
- RFQ issued on March 6, 2007
- 12 responses received on April 24, 2007
- Evaluation process and formal publishing of list to be completed by June 15.

## Next steps

- Finalize all required contractual documents by September 2007
  - Agency participation agreement
  - RFP
  - Form of Contract
- Finalize policy and resource issues
  - Develop program organization – where does it reside?
  - Develop program policies and procedures

## Next steps continued

- Initial project list developed by August 2007
  - First wave of projects developed through the RCx program
  - Working with DMV on program-wide projects
  - Partner with utilities to provide targeted preliminary assessments for project identification.

## State & IOU Partnership Opportunities



DGS – IOU Partnership will provide  
almost \$17 million for energy  
efficiency projects in state buildings

## Opportunities (cont'd)

1. **Peak Demand Reduction**
2. **Lighting Systems Energy Conservation**
3. **HVAC Systems Energy Efficiency Optimization**
4. **Mechanical Systems Energy Efficiency & Optimization**
5. **Water Systems Energy Conservation**
6. **Food Service Facility Energy Efficiency & Optimization**
7. **Distributed Generation**
8. **Savings By Design**

# Partnership Update

- The IOU's have met with the following state agencies to explain the opportunities of the partnership:
  - Department of General Service - DGS
  - Department of Motor Vehicles – DMV
  - Department of Transportation - Caltrans
  - Department of Water Resources - DWR
  - Department of Developmental Services - DDS
  - Department of Mental Health - DMH
  - California Highway Patrol – CHP
  - California Department of Corrections & Rehabilitation - CDCR
  - Judicial Council of California

# Partnership Update (cont'd)

- These agencies represent a major portion of state-occupied office space
- The IOU's have performed audits to help the agencies identify potential projects/measures.
- A number of energy efficiency projects have been identified for both retrofit and new construction.
- Agencies are in need of identify funding sources to implement additional projects.

# Clean Onsite Generation



# Clean Onsite Generation

- Reduce Annual Energy Consumption from the Utility Grid
- Reduce Peak Electrical Demand
- More Efficient Utilization of Fuel Sources
- Renewable Onsite Generation (Solar, Wind) Offers Greatest Potential for Reducing GHG Emissions (i.e. Carbon Footprint)

# Clean Onsite Generation Options

- Solar Photovoltaic (PV)
  - Phase I Projects
    - 4.24 MW Installed
      - Chuckawalla Valley and Ironwood State Prison
      - Patton State Hospital
      - Caltrans District 10
      - CSU Dominguez Hills, Chico, Cal Poly SLO, San Bernardino
    - Annual Generation of 6,757,985 kWh
    - 3<sup>rd</sup> Party Power Purchase Agreements (PPA)
    - Estimated GHG Reductions: 5,440,178 lbs of CO2 per Year (at 805 lbs per MWh)

# Clean Onsite Generation Options

- Solar PV (cont.)
  - Phase II Projects
    - Targeting 10 MW in Projects
    - Larger Projects Generally More Economical
      - Focusing on 1 MW Ground Mounted Arrays
    - Continue Utilizing 3<sup>rd</sup> Party PPA Business Model
    - Release RFP June/July 2007 Timeframe
    - Award Bid October 2007 (Estimate)
    - Phase III by End of Fiscal Year 2007/2008
    - Solar Thermal

# Clean Onsite Generation Options

- Fuel Cell
  - Large Stationary Systems
    - CalEPA Building
    - Central Plant
    - Corcoran State Prison
    - DMV Headquarters Sacramento
  - Back Up Power Applications
    - Telecom Sites
    - 10<sup>th</sup> Street State Garage
    - New State Printing Plant

# Clean Onsite Generation Options

- Combined Heat and Power
  - 1.8 MW at DGS Facilities
  - Opportunities at State Facilities
  - Fuel Cell Projects Installed in CHP Application
- Other
  - Wind (California Correctional Institute Tehachapi)
  - Biomass Energy

# Clean Onsite Generation Issues

- Cost Effectiveness
  - Utility Tariff Rate
  - Cost of Natural Gas
  - Implementation Costs (Retrofit)
- Technology Issues
  - O&M Costs
  - Maturity
  - Costs
- Design Issues